

REMARKS

The Office Action dated April 23, 2003 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

The drawings were objected to because of the informalities noted in the Notice of Draftperson's Patent Drawing Review (PTO948). Replacement drawings are submitted herewith and those replacement drawings correct those noted informalities. Acceptance of the replacement drawings is respectfully requested.

Claims 1-56 are presently pending in the above-cited application. In the Office Action, claims 14-15, 22, 26-27, 32-33, 44-47, 52 and 56 were objected to because of minor informalities. The noted informalities have been addressed and withdrawal of the objection is respectfully requested.

Claims 1-7, 18-25, 33-39 and 48-55 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Pepper* (U.S. Patent No. 4,713,607) in view of *Eastman* (U.S. Patent No. 720,335). Claims 12-17, 26, 44-47 and 56 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Pepper* in view of *Eastman* and *Fried et al.* (U.S. Patent No. 6,023,138). Claims 8-11 and 40-43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Pepper* in view of *Eastman* and *Minneman et al.* (U.S. Patent No. 5,386,188). Claims 1, 2, 22, 33, 34 and 52 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Minneman et al.* in view of *Eastman*. Claims 3-7, 35-39, 23-25 and 53-55 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Minneman*

et al. in view of *Eastman* and “using PCB as a Current Shunt”, *Electronics World* and *Wireless World*. The rejections of claims are respectfully traversed according to the remarks that follow.

The present invention is directed, according to claim 1, to a system for measuring core power of a circuit on a printed circuit board (PCB). The system includes a first circuit, a power plane feeding the first circuit, a power strip for providing power to the power plane disposed in the PCB connected to the power plane and having at least two vias; a calibration strip having a predetermined width and being disposed in the PCB, the calibration strip having at least two vias for measuring a voltage drop and a second circuit configured to measure a first voltage drop across the at least two vias of the power strip as a first voltage and a second voltage drop across the at least two vias of the calibration strip as a second voltage and to perform a power calculation by calculating a power being fed to the first circuit based on the first voltage and the second voltage.

The present invention is directed, according to claim 22, to a system for measuring core power of a circuit on a printed circuit board (PCB). The system includes a first circuit, a power plane feeding the first circuit, a power strip disposed in the PCB connecting a first power supply to the power plane and having at least two vias for measuring a voltage drop, and a second circuit configured to measure a first voltage drop across the power strip as a first voltage, a temperature of the power strip, and perform a power calculation by calculating the power being consumed by the first circuit based on the first voltage and the temperature.

The present invention is directed, according to claim 27, to a method for determining core power of a circuit on a printed circuit board (PCB). The method includes the steps of disposing a power strip having a first predetermined length and width into the PCB between a power source during the manufacturing process, disposing a calibration strip having a second predetermined length and width into the PCB during the manufacturing process, attaching a second power supply to the calibration strip and grounding the power strip to form a current flow through the power strip, measuring a first voltage drop across the power strip as a first voltage, measuring a second voltage drop across the calibration strip as a second voltage and calculating the power to the circuit based on the first and second voltages, the first predetermined length and width and the second predetermined length and width.

The present invention is directed, according to claim 33, to a system for measuring core power of a circuit on a printed circuit board (PCB). The system includes a first circuit, a power plane means feeding the first circuit, a power strip means for providing power to the power plane disposed in the PCB connected to the power plane and having at least two means for measuring a voltage drop, a calibration strip means having a predetermined width disposed in the PCB, the calibration strip means having at least two means for measuring a voltage drop and a calculation means for measuring a first voltage drop across the power strip means as a first voltage and a second voltage drop across the calibration strip means as a second voltage and for performing a power calculation by

calculating the power being fed to the first circuit based on the first voltage and the second voltage.

The present invention is directed, according to claim 52, to a system for measuring core power of a circuit on a printed circuit board (PCB). The system includes a first circuit, a power plane means for feeding the first circuit, a power strip means disposed in the PCB for connecting a first power supply to the power plane and having at least two means for measuring a voltage drop and a calculating means for measuring a first voltage drop across the power strip means as a first voltage, for measuring a temperature of the power strip means, and for performing a power calculation by calculating the power being fed to the first circuit based on the first voltage and the temperature.

In all of the rejection of the claims, one of two base references was applied: *Pepper* and *Minneman et al.* *Pepper* is directed to a current sensing circuit senses current and signals if such current exceeds a predetermined level within an etched circuit board. *Minneman et al.* is directed to a circuit and method of measuring current within a circuit without breaking the circuit. The Office Action acknowledges many of the deficiencies of those references, as applied to the claims; specifically the Office Action acknowledges that neither *Pepper* nor *Minneman et al.* references teaches measuring a temperature of the power strip and counting the temperature effect into a calibration of resistance nor the use of a calibration strip and using a voltage drop across that calibration strip as a second voltage in determining resistance.

With respect to the independent claims, claims 22 and 52 recite the use and measurement of temperature and claims 1, 27 and 33 recite the use of a calibration strip. In the above-referenced rejections, the Office Action relies upon *Eastman* in an attempt to cure the deficiencies noted above. *Eastman* is directed to an arrangement for compensating for the variation in the resistance of the measuring instrument and the conductor caused by variations in temperature. Although the Office Action applies *Eastman* in an attempt to cure the deficiencies of *Pepper* and *Minneman et al.*, *Eastman* does not teach or suggest what it has been alleged to teach or suggest.

Independent claims 22 and 52 recite, in part, “measure . . . a temperature of said power strip” or “calculating means for measuring . . . a temperature of said power strip means.” While *Eastman* does disclose compensating for temperature, it does not teach or suggest measuring a temperature. Given the arrangement in *Eastman*, no measurement of temperature is needed and it is not contemplated therein. One of ordinary skill in the art would not be motivated to measure a temperature of the power strip in view of *Eastman* or the other references cited in the Office Action. The mere compensation for temperature would not meet the requirements of claims 22 and 52 and, given the other elements contained in those claims, the compensation would not allow for the temperature to be used in the apparatus of the present invention. For at least this reason, Applicants respectfully assert that the rejections of claims 22 and 52 are improper for failing to teach or suggest all of the elements of those claims. The rejection of claims 23-26 and 53-56 would likewise be improper for at least their dependence on independent

claims 22 and 52. Reconsideration and withdrawal of the rejection of those claims are respectfully requested.

Independent claims 1, 27 and 33 recite, in part, “a calibration strip having a predetermined width and being disposed in said PCB” and “a second voltage drop across said at least two vias of said calibration strip as a second voltage and to perform a power calculation by calculating a power being fed to said first circuit based on said first voltage and said second voltage” or similar limitations. Applicants respectfully assert that *Eastman* does not teach or suggest the use of a calibration strip as disclosed and claimed in the present invention.

The wire (conductors c & d) in *Eastman*, for which the Office Action seeks to have teach or suggest the calibration strip, is disclosed to be of high resistance (column 2, line 76) and has a much higher resistance than the main conductor that is being measured. Such a conductor would not be appropriate as a calibration strip as claimed in claims 1, 27 and 33. Additionally, the purpose of the calibration strip is clear from its recitation: it is a strip to calibrate the power strip. This purpose is discussed in greater detail in the specification at page 11, lines 1-11. The conductors c & d, used in *Eastman*, have a very different purpose and one of ordinary skill in the art would not have been motivated to incorporate elements of *Eastman* into either *Pepper* or *Minneman et al.* to reach the claims of the present invention.

For at least this reason, Applicants respectfully assert that the rejections of claims 1, 27 and 33 are improper for failing to teach or suggest all of the elements of those

claims. The rejection of claims 2-21, 28-32 and 34-51 would likewise be improper for at least their dependence on independent claims 1, 27 and 33. Reconsideration and withdrawal of the rejection of those claims are respectfully requested.

As such, Applicants respectfully assert that claims 1-56 should now be allowed and that the application should be allowed to proceed to issue. If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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